

B

separating the plant stems, pre-treating the plants, forming a fibre mass of vegetable fibres, forming a mat with randomly oriented fibres by a dry forming process, forming inter-fibre bonds between the fibres and fixing the mat with the bonded fibres.

13. The method of claim 12, wherein the retting comprises retting the stems wholly.

14. The method of claim 12, wherein the retting comprises retting the stems partially.

Subj 1

15. The method of claim 12, wherein the forming inter-fibre bonds comprises partially establishing the bonds when the fibres are fibrillated.

16. The method of claim 12, further comprising drying the fibres to have a desired water content.

Subj 2

17. The method of claim 12, wherein the forming fibres comprises forming single fibres.

18. The method of claim 17, wherein the lengths of each of the single fibres are between about 0.1 mm to about 30 mm.

19. The method of claim 12, wherein the shortening comprises processing the fibres to lengths between about 3 mm and 20 mm.

20. The method of claim 19, wherein the shortening comprises processing the fibres to lengths between about 4 mm and 15 mm.

21. The method of claim 12, wherein the retting comprises retting the fibres partially on the field.

B1

22. The method of claim 21, wherein the retting comprises further controlled retting in water containing enzymes, and wherein the controlled retting occurs before the shortening.

Sub C1

23. The method of claim 12, wherein the forming inter-fibre bonds comprises applying binders and establishing the inter-fibre bonds.

24. The method of claim 23, wherein the applying binders comprises applying binders selected from the group consisting of organic binders, synthetic organic binders, natural binders, and combinations thereof.

25. The method of claim 12, wherein the harvesting comprises harvesting plants selected from the group consisting of flax, hemp and combinations thereof.

Sub C2

26. The method of claim 12, wherein the pre-treatment further comprises scutching the stems in a hammer mill, wherein the shortening further comprises shortening the fibres to a desired length and separating the fibres within a desired length interval by a rotating riddle, and wherein the dry-forming comprises forming some of the fibres into the mat by blowing the fibres into a forming head disposed above a forming wire.

27. The method of claim 26, wherein the forming the mat comprises adding between about 0 % and 50 % binder and fixing the formed mat.

28. The method of claim 27, wherein the forming the mat comprises forming the mat with between about 0 % and 10 % shives.

29. The method of claim 12, wherein the shortening and

B | *5b* | *C6* | separating the fibres comprises shortening and separating in a dry condition, and wherein the pre-treatment comprises pulping the fibres by boiling the fibres in pure water under pressure or in an extruder, chemically treating the fibres, washing and drying the fibres before dry-forming the fibres into the mat.

30. The method of claim 29, wherein the chemically treating comprises treating with a base.

31. The method of claim 12, wherein the forming the mat comprises forming a mat having a non-woven mat character.

32. The method of claim 31, wherein the forming the mat comprises forming the mat with a thickness between about 2 mm and 300 mm, and with gram weights between about 30 g/m² and 8000 g/m².

33. The method of claim 12, wherein the forming the mat comprises forming an absorbing fibre mat.

5b | *C7* | 34. The method of claim 33, wherein the forming the absorbing mat comprises incorporating the absorbing mat in a molded composite product.

35. The method of claim 33, wherein the forming the absorbing mat comprises incorporating the absorbing mat in a strongly reinforced composite product.